

TAXONOMIC STUDIES ON SOME NEOTROPICAL
LEPTOPHLEBIID MAYFLIES

(Ephemeroptera: Leptophlebiidae)

THOMAS B. THEW

451 16th Ave., East Moline, Illinois

The family Leptophlebiidae is found throughout the world and is frequently encountered in collections from Central and South America, where it forms a large and interesting part of the mayfly fauna. This paper consists of the descriptions of seven new species and notes on several others, all of which belong to this group. For the most part, the specimens considered here are from a large collection made for me by Fritz Plaumann in Nova Teutonia, province of Santa Catarina, Brazil (lat. 27°-11', long. 52°-23'; elevation 300-500 m.), and they are in my personal collection unless stated otherwise. Also, I have taken this opportunity to report upon a new species from Chile in the collections of the Illinois Natural History Survey.

GENUS *THRAULODES* Ulmer

At present, this genus consists of 21 described and named species. Two new species are described below.

Thraulodes daidaleus Thew, new species

Male Imago.—Lengths: body 7.2 mm.; forewing 6.6 mm.; caudal filaments 15.0 mm. *Head*: white, shaded with grey-black about ocelli; vertex white; frontal shell white with median anterior margin lightly suffused with red-brown; face and vestigial mouthparts white, marked with greyish black. Antennal scape yellow-white; pedicel white, shaded with yellow-brown distally; flagellum very light yellow-brown. Turbinate portion of compound eyes light brownish orange, contiguous on meson; lower portion black. *Thorax*: pronotum yellow-white with median and lateral portions of posterior margin black; pleura yellow-white with short oblique black stripe; sternum yellow-white, shaded with red-brown medially. Mesonotum light yellow-brown; antero-lateral margins and posterior median area (not including tip of scutellum) broadly white; sutures finely margined with dark brown; pleura yellow-white with broad brown oblique stripe running from wing base past anterior margin of coxal cavities; areas about coxal cavities and wing base broadly marked with blackish brown; extreme anterior margin of sternum with broad medium brown band; remainder white anteriorly, medium brown posteriorly. Metanotum light brown with lateral margins broadly white and with posterior edge finely margined with black; pleura yellow-white, broadly marked with blackish brown about coxal cavities; sternum light brown. *Wings*: hyaline; longitudinal veins of forewing yellow-hyaline; crossveins hyaline; stigmatic area milk-white. All veins of hindwing hyaline. In both wings, area about humeral brace suffused with dark brown. *Legs*: all legs similar; coxae and trochanters yellowish white, marked with black-

brown; femora yellowish white for basal two-thirds with faint brown band on the outer surface and black dot on inner surface, one-third of distance from base; distal one-third medium brown, proximal edge of which shade into a narrow dark brown band; edges of brown area finely black; tibiae yellowish white with pre-apical brown band and with apex white; tarsi very light brown with joints white. *Abdomen*: tergites of segment 1 white with light brown anterior margin and median and lateral black spots; segments 2-6 transparent white with large postero-median black spot, large lateral black spots with a small black spot lateral to these and another faint black blotch on each antero-lateral margin; median area very lightly suffused with red-brown; median portion of posterior margin of segment 6 light red-brown; segments 7-10 reddish brown with black median streak and lateral black spot. All segments with black stigmatic dots. Sternites of segments 2-7 white with two small black dots on each side of median line and a larger black dot in each postero-lateral corner; sternites 8-10 yellowish white, 8 with postero-lateral dots. *Genitalia*: yellow-white, as in fig. 1. *Caudal filaments*: white with every fourth segment dark brown.

Female Imago.—As in the male, with the following exceptions. Lengths: body 6.3 mm.; forewing 7.5 mm.; caudal filaments 7.5 mm.; abdominal segments 1-6 and proximal half of 7 medium brown; distal half of 7 and all of 8 white; 9-10 light pinkish brown. This pinkish coloration is undoubtedly due to the presence of eggs within the abdomen.

Holotype male: NOVA TEUTONIA, SANTA CATARINA, BRAZIL, January 1956 (Fritz Plaumann, collector); preserved in alcohol. Allotype, female: same data, except collected in November 1956; preserved in alcohol. Both types are in the collections of the Illinois Natural History Survey. Paratypes: 2♂♂, same data as for holotype and preserved in alcohol, in my personal collection; 8♂♂, 2♀♀, all pinned, from Nova Teutonia, Brazil, January 3-5, 1956, with 1♂ in the collection of the Illinois Natural History Survey and the remainder in my personal collection. Also, there are 3♂♂ and 3♀♀ subimagos from the same locality collected in September 1956.

Etymology: from Gr., daidaleos-dappled, spotted.

Thraulodes daidaleus belongs to the *trijunctus* group. The male genitalia will separate it from all other species for which figures of this structure have been published. For the remaining species, the coloration is considerably different.

Thraulodes traveræ Thew, new species

Male Imago.—Lengths: body 6.3-7.0 mm.; forewing 7.0-8.0 mm.; caudal filaments 10.0 mm. *Head*: dark brown; face and vestigial mouthparts marked with white. Antennal scape and pedicel dark brown, flagellum missing. Turbinate portion of compound eyes pink, lower portion black. *Thorax*: pronotum yellowish white with median area suffused with medium brown; pleura yellowish white with broad, dark brown oblique stripe running from posterior

corner of pronotum to forecoxal cavities; sternum yellowish white. Mesonotum deep brownish yellow with sutures finely margined in dark brown; pleura deep brownish yellow, except around coxal cavities, where it is white and is marked broadly with black; anterior half of sternum yellowish-white and with broad transverse brown band; posterior half light brown laterally and medium brown medially. Metanotum light yellow-brown with several faint transverse black-brown lines; pleura same as mesopleura; anterior half of sternum light translucent brown, posterior half medium brown. *Wings*: hyaline; longitudinal veins of forewing light yellow; crossveins hyaline; area about humeral brace suffused with dark brown; stigmatic area milky. Hindwing completely hyaline, except for area around humeral brace, which is suffused with dark brown. *Legs*: all coxae and trochanters yellowish white, marked with black-brown. Fore femur white for basal one-fourth, then next fourth dark brown, followed by a narrow band of white and then a narrow band of dark brown, and apical fourth medium brown; tibia yellowish white with apex dark brown; tarsi yellowish white. Mid and hind femora with basal broad band of white, followed by a narrow band of dark brown and then a narrow band of light brown, next another broad white band, followed by a narrow band of dark brown and a narrow band of medium brown, and with apex white; tibiae and tarsi yellowish white with bases of tibiae suffused with light brown. *Abdomen*: segments 2-6 transparent white, 7-10 light brownish orange; segment 1 light brown. Tergites 1-7 with the following maculation of dark brown: 1) submedian spot on each side of middorsal line, narrowly joined to each other on posterior margin; 2) a large spot lateral and contiguous to these; 3) a large spot in postero-lateral corner; 4) small dark median and faint, small, posterior stigmatic dots. Sternites with median area lightly suffused with very light red-brown and with small dark brown dot in extreme postero-lateral corners. *Genitalia*: as in fig. 2. *Caudal filaments*: white, with every fourth segment black, the following segment black proximally, and with distal joint of this segment narrowly black.

Female Imago.—As in the male, with the following exceptions: lengths, body 6.3 mm.; forewing 6.3 mm.; caudal filaments 9.0 mm.; head suffused with grey dorsally with two submedian black dots between the eyes. Legs similar but fore tibia lacking distal brown band. All veins and crossveins in forewing yellowish hyaline. Abdominal segments 1-6, proximal half of 7, and all of 9-10 light brownish-orange, but with the maculation as in the male.

Holotype male, and allotype female: NOVA TEUTONIA, SANTA CATARINA, BRAZIL, January 1956 (Fritz Plaumann, collector); preserved in alcohol. Both types are in the collections of the Illinois Natural History Survey. Paratypes: all with the same data, except for the dates; 1♂, November 1956 preserved in alcohol and in my personal collection; 7♂♂, January 1956 and 1♀ November 1956 preserved in alcohol, two males each in the collections of Dr. Jay R. Traver and Institut Royal des Sciences naturelles de Belgique; 50♀♀, January 1-7, 1956, all pinned, two females each in the collections of Dr. Lewis Berner, Dr.

G. F. Edmunds, Jr., the California Academy of Sciences, and the Illinois Natural History Survey, with the remainder in my personal collection. In addition, there are 9♂♂ and 6♀♀ subimagos with the same data, but collected in September 1956 and 2♂♂ subimagos collected in November 1956 which also appear to be of this species, in my personal collection

Etymology: I am pleased to name this species in honor of Dr. Jay R. Traver in recognition of her outstanding work on the Neotropical mayflies and, also, of the constant aid which she has given me in the study of the group.

The markings of the abdomen would place this species close to *T. furficulus* Traver, but *T. traverae* is much smaller and has greatly differing male genitalia and a different maculation pattern on the legs.

GENUS TRAVERELLA Edmunds

This genus was proposed in 1948 by Edmunds for the two North American species then placed in the genus *Thraulius*, *albertana* (McDunnough) and *presidiana* (Traver), with the former as the type of genus. It was characterized in the adults from the type of *Thraulius*, *T. bellus* Eaton, by the asymmetrical forking of vein R_{4+5} in the forewing and by the presence of basal spines on the male forceps plate. Later (1950) Edmunds placed two Neotropical species in the genus—*T. erhardti* (Ulmer) and *T. maculipennis* (Ulmer). Thus the matter rested until Demoulin (1955c) noted that all of the remaining American species placed in *Thraulius* also had an asymmetrical forking of vein R_{4+5} , but did not possess the basal spines characteristic of *Traverella*. For these species he proposed another genus, *Homothraulius*, with *H. missionensis* (Esben-Peterson) as the type.

In at least two cases, however, it appears that the species assigned to *Homothraulius* should have been placed in *Traverella*. The first is that of the species *roundsi* Traver. The figure of the male genitalia given by Traver (1947) in the original description definitely shows basal spines present on the forceps plate; they are similar in form to those of *T. presidiana* (Traver). Secondly, in the same paper (1947) Traver states that there appeared to be such basal spines in the species *bradleyi* Needham and Murphy, although they were difficult to determine for certain. As the shape of the penis lobes is very much like that of *T. erhardti* (Ulmer) a form not found in *Homothraulius*, it appears likely that *bradleyi*

should also be included in *Traverella*. As a result, I hereby place these two species as *Traverella roundsi* (Traver), (new combination), and *Traverella bradleyi* (Needham and Murphy), (new combination).

In addition, the figure presented by Ulmer (1943) of the male genitalia for *H. montium* (Ulmer) seems to show basal spines. The genitalia are so unusual, however, that I think it is best to leave it in *Homothraulius* until more is known about it.

TRAVERELLA ERHARDTI (Ulmer)

This species has been known previously only from Hansa, province of Santa Catarina, Brazil. One male and one female, collected from Nova Teutonia, Brazil, January 3 and January 1, 1956, respectively, are present in my collection and appear to be of this species.

GENUS ULMERITUS Traver

The genus *Ulmeritus* was first described by Traver in 1956 for the unusual new species, *U. carbonelli*, from Uruguay. At the same time, she described a variant of this form as *Ulmeritus* sp. and transferred *sao-paulense* Traver from *Atalophlebiodes* to the new group. This action left only two neotropical species in *Atalophlebiodes*. Somewhat earlier, Harker (1954) had shown that the type of *Atalophlebiodes* and the other Australian and New Zealand species were not congeneric with those placed therein from South America. This was noted by Traver (1959), whereupon she transferred *Atalophlebiodes flaveopodes* (Spieth) and *Atalophlebiodes haarupi* (Esben-Peterson) to *Ulmeritus*. At the same time, Traver also described two new species in this genus, *U. uruguayensis* and *U. luteotinctus*, and then separated the known species into three subgenera—*Ulmeritus*, *Pseudulmeritus*, and *Ulmeritoides*.

In my material from Brazil there are specimens of the *Ulmeritus* sp. of Traver, which I am considering to be a distinct and new species, as well as specimen representing two other new species. *Ulmeritus* sp. definitely belongs to the subgenus *Ulmeritus*; the new species *U. adustus* can be placed in *Ulmeritoides* as described by Traver. The other species described below, *U. patagiatus*, is known only in the subimagal form and does not conform well to any of the subgenera as now delimited. The hind wing is similar to those of both *Ulmeritoides* and *Pseudulmeritus*, the male genitalia is of an intermediate type, and the

ratios of the leg segments are not known, of course, for the imagal state. Therefore, I am not placing the species in any subgenus at the present time.

Ulmeritus balteatus Thew, new species

Ulmeritus sp. Traver, 1956. Proc. Ent. Soc. Wash. 58:11.

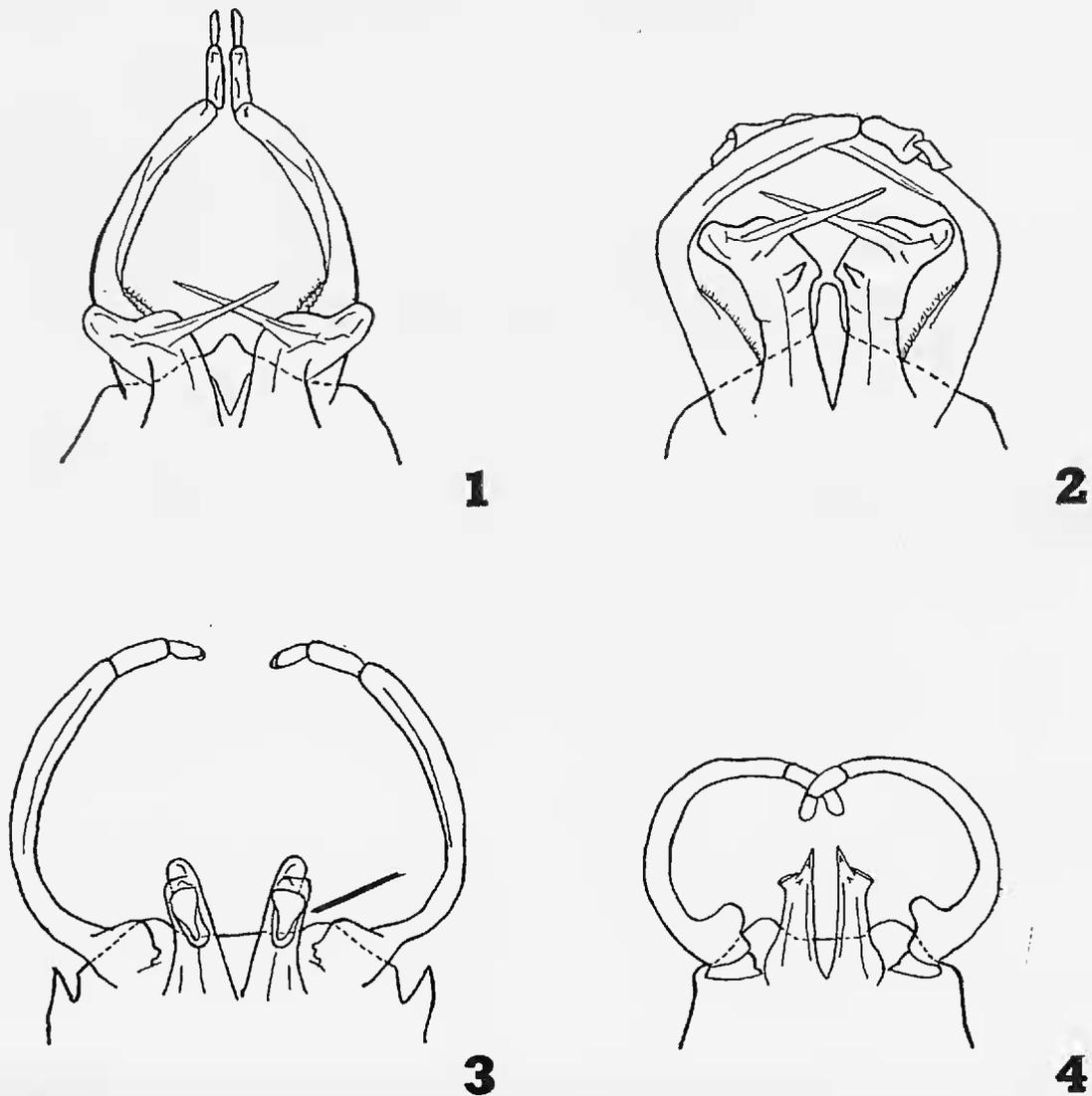
Male Imago.—Lengths: body 10.0 mm.; forewing 10.5 mm.; caudal filaments missing. *Head*: white; frontal shelf, vertex between compound eyes, and lateral margins black. Face white, marked with black; venter white, with vestigial mouthparts black. Antennal scape and pedicel light yellow-brown; flagellum light brown. Turbinate portion of compound eyes peach colored; lower portion blackish grey. *Thorax*: pronotum yellow-white; median area with a narrow black longitudinal line, which forks like a "Y" a short distance before reaching the posterior margin; the "arms"—narrow black lines—join a broad black line which margins the lateral edges; a narrow black longitudinal line in each lateral area; pleura yellow-white, heavily infuscated with black; sternum deep yellow with a transverse black band between fore coxae and with blackish infuscation posteriorly. Mesonotum very deep yellow with median line and other sutures very narrowly black; extreme antero-lateral areas lightly infuscated with grey; pleura light yellow, heavily marked with black; sternum deep yellow with median line broadly black and with basisternum and lateral edges brownish. Metanotum deep yellow with a few narrow transverse streaks; pleura as for mesothorax; sternum yellow-brown. *Wings*: forewing hyaline, except for costal and subcostal interspaces and basal three-quarters of membrane posterior of Cu_1 , which are brown; crossveins dark brown with membrane surrounding each stained with dark brown; longitudinal veins yellow-brown. Hindwing light brown, fading to almost hyaline posteriorly; longitudinal veins brownish-hyaline; crossveins dark brown, each surrounded by a dark brown spot as in the forewing. *Legs*: fore coxae and trochanters deep yellow, marked with dark brown; fore femur deep yellow, with apex shaded with dark brown; tibia medium brown, somewhat lighter proximally, and with apex yellow; tarsi medium brown, with joints narrowly ringed with yellow. Mid and hind legs similar, except tibiae and tarsi light yellow and tarsal joints narrowly ringed with brown. *Abdomen*: medium brown; tergites with pale median stripe, bordered on each side by a very narrow dark brown stripe; large pale spot antero-laterally and the lateral ganglionic area suffused with dark brown; each segment with narrow dark brown transverse band on posterior margin. Sternites light yellow-brown, with dark brown median spot on the anterior margin, which has a very narrow dark brown stripe running to middle of segment from each side; posterior margins shaded with medium brown. *Genitalia*: forceps light yellow-brown, becoming darker distally; penis lobes yellow-white, as in fig. 3. Caudal filaments missing.

Female Imago.—There seem to be no major differences between the females of this species in my collection and the description of this sex as presented by Traver (1956).

Holotype male: NOVA TEUTONIA, SANTA CATARINA, BRAZIL,

February 1957 (Fritz Plaumann, collector); preserved in alcohol. Allotype, female: same data as for holotype, except collected on January 6, 1956; pinned. Both types are in collections of the Illinois Natural History Survey. Paratypes: all with the same data as for holotype, except for dates; 1♂, February 1957, and 1♂, September 1956, both in alcohol and in my personal collection; 1♀, January 4, 1956, pinned, and in my personal collection. In addition, there are many subimagoes of both sexes collected at the same locality in January, September, and November of 1956 and in February of 1957 in the collections of Dr. Lewis Berner, the California Academy of Sciences, Dr. G. F. Edmunds, Jr., Institut Royal des Sciences naturelles de Belgique, Dr. Jay R. Traver, and the author.

Etymology: from L., balteus-belt or band.



EXPLANATION OF FIGURES

Figs. 1-4, male genitalia. 1. *Thraulodes daidaleus* Thew; 2. *Thraulodes traveræ* Thew; 3. *Ulmeritus balteatus* Thew; 4. *Ulmeritus adustus* Thew.

Variation in the male paratypes: there seem to be no striking differences between the male paratype collected at the same time as the holotype. For the other one, the following differences were noted: fore femora shaded with dark brown on the inner surface; infuscation of the basal region of the forewing and also that of the hindwing somewhat lighter in color and less extensive.

In the genus *Ulmeritus* as here considered, *U. balteatus* is closely related to *U. carbonelli* Traver, the type of the genus. Traver (1956) had specimens of this species which she referred to as *Ulmeritus* sp.; she placed no name on them, for she had no imaginal males in her collection and so could not determine if there were genitalic differences; she also questioned whether the coloration differences were taxonomic or ecological. The specimens described here not only show small, yet definite differences in the male genitalia in comparison with *U. carbonelli*, but also possess the same color characters, *i.e.* the heavy bands of dark spots across the middle and base of the forewing as did Traver's specimens. As Nova Teutonia is about 450 miles from the Santa Lucia River, Arequita, Lavealleja Province, Uruguay, the locality from which her specimens came, I conclude that these differences are taxonomic and not ecological and that both series represent the same new species.

Ulmeritus adustus Thew, new species

Male Imago.—Lengths: body 5.4 mm.; forewing 5.9 mm.; caudal filaments broken. *Head*: yellow-white; vertex between compound eyes with two dark brown spots and with posterior margin dark brown; median area around ocelli shaded with dark brown; face and vestigial mouthparts yellow-white, marked with brown. Antennal scape and pedicel yellow, flagellum white. Ocelli normal. Turbinate portion of compound eyes light orange in preserved specimens, lower portion black. *Thorax*: pronotum light yellow-brown; lateral margins shaded with black; median line with narrow black longitudinal line, which is intersected near the posterior margin by a similar short transverse stripe, with a lateral black longitudinal stripe on each side; anterior margin black-brown; pleura yellowish white, marked with blackish brown, which blends into medium brown basisternum. Mesonotum deep medium brown, with sutures finely marked with black; antero-lateral margins and tip of scutellum broadly margined with brown; pleura similar, but with yellow-white areas about wing base and coxae; sternum deep medium red-brown, except around coxae, where it is light brown. Metanotum medium brown, with posterior finely margined in black; pleura deep medium brown, with sutures marked with black; sternum light brown. *Wings*: hyaline; longitudinal veins of forewing light yellow-brown anteriorly, whitish hyaline posteriorly; crossveins hyaline; extreme wing bases lightly suffused with brown;

stigmatic area milky. Hindwing with extreme basal subcostal space suffused with brown; veins hyaline, as in fig. 4. *Legs*: all coxae and trochanters yellowish white, marked with brown. Fore femora light yellow-brown, with preapical and apical dark brown bands; tibiae dark brown, with broad median and narrow apical bands of pure white; tarsi yellowish white, with joints pure white. Mid-femora yellowish white with faint basal and median and dark apical bands of brown; tibiae white with brown apical band; tarsi white, except for distal segment, which is light brown. Hind femur yellow-white with basal, median and apical bands of dark brown; tibiae pure yellowish white; tarsi as in midleg. *Abdomen*: tergites dark brown; posterior margins of segments 1-9 yellow-white, all segments with anterior margin yellow-white in median area; segments 1-2 with two submedian light brown dots, these fusing on segments 3-10 to form mesal, yellowish white triangles, which are gradually larger posteriorly; all segments with large lateral light spot on each side and possessing black stigmatic dots; segments 1-8 with yellow spot in antero-lateral area, which is attached by a narrow yellow oblique stripe to the lateral spot. Sternites light yellow, with segments 1-4 shaded with very light brown, except for median light spot; segments 9-10 shaded with light brown medially; segments 7-8 with lateral brown dot on each postero-lateral corner; all segments with posterior margins shaded with light brown and with dark brown lateral ganglionic marks. *Genitalia*: forceps yellowish white penis lobes yellow-brown, as in fig. 5. *Caudal filaments*: white, with joints very finely marked with brown.

Female Imago.—As in the male, with the following exceptions: lengths, body 6.0 mm.; forewing 6.8 mm.; caudal filaments 6.3 mm. Head yellow, with anterior and posterior margins broadly black and with black median spot, which has narrow oblique black lines proceeding anteriorly. Mesonotum yellow. Abdominal color lighter; second lateral spots not so distinct. Wing membrane without brown suffusions.

Holotype male, and allotype, female: NOVA TEUTONIA, SANTA CATARINA, BRAZIL, February 1957 (Fritz Plaumann, collector); preserved in alcohol. Both in the collections of the Illinois Natural History Survey. Paratypes: same data as for holotype; 44♂♂ and 61♀♀; preserved in alcohol; two of each sex in the collections of Dr. Lewis Berner, the California Academy of Sciences, Dr. G. F. Edmunds, Jr., Institut Royal des Sciences naturelles de Belgique, and Dr. Jay R. Traver; the remainder are in my personal collection; 6♂♂ and 1♀, same data as for holotype, but collected in January 1956, and 5♂♂ and 2♀♀, same as for holotype, except collected in September 1956; all in alcohol and in my personal collection. Also, there are many male and female sub-imagoes, which have the wing membrane and the veins black, collected in February 1957 and in my personal collection.

Etymology: from L., *adustus*-tanned, brown, swarthy.

This species is very closely allied to *U. uruguayensis* Traver.

The male genitalia of the two are very similar, except that the penis lobes of *adustus* bear two small spines which are lacking in *uruguayensis*. In addition, the coloration, especially of the legs and abdomen, but also in many lesser details, is definitive for each of the species. Thus, I feel that they are distinct, but closely related species.

Ulmeritus patagiatus Thew, new species

Male Subimago.—Lengths: body 10.7 mm.; forewing 10.9 mm.; caudal filaments 7.0 mm. *Head*: yellow-white; black-brown spot on vertex between the compound eyes; face and vestigial mouthparts white, marked with black-brown. Antennal scape yellow-brown; pedicel white for proximal one-fourth, remainder yellow-brown; flagellum yellow-brown. Turbinate portion of compound eyes light tanish pink, lower portion black. *Thorax*: pronotum yellowish white, with oblique black-brown stripe on each side of median line, leading from postero-lateral corners to median line; lateral margins broadly brown-black; pleura and venter light brown, with sutures broadly marked with yellowish white. Mesonotum light yellow-brown, except for anterior region, which is light yellow; median line and oblique antero-lateral sutures white; pleura brown, marked with yellow-white; sternum medium brown. Metanotum light yellow; pleura and sternum as for mesothorax. *Wings*: translucent (would be hyaline in imago); forewings with veins C, Sc, and R yellow; all remaining longitudinal veins and crossveins whitish hyaline; all veins narrowly margined on all sides with brown. Hindwing with all veins whitish hyaline, except in basal radial area, which is brown. *Legs*: all coxae and trochanters yellow, heavily marked with brown; fore femora yellow with dark brown band one-third distance from apex and with apex brown; edges distally shaded with brown; heavy brown longitudinal stripe on outer margin for basal two-thirds; tibia dark brown with extreme base and median area light and with apex white; first tarsal segment white; remainder grey proximally, white distally. Mid femur yellow with apex brown and with median brown spot on outer margin; tibia and tarsi yellow-white, faintly shaded with light brown. Hind femur yellow, with median and apical brown bands and with proximal half heavily shaded with dark brown on both sides; tibia and tarsi as for midlegs. *Abdomen*: tergites light brown, with following yellow markings: 1) a median stripe, gradually increasing in width posteriorly; 2) immediately lateral to this, a large spot on the anterior margin on each side (distinction between stripe and spots obliterated on segment 1); 3) a lateral spot; 4) a spot in the antero-lateral corner; 5) a median spot in the stigmatic area. Sternites light brown with median line and extreme lateral areas yellow. All segments narrowly margined with black posteriorly. *Genitalia*: yellow-white, as in fig. 6. *Caudal filaments*: white, with joints ringed with dark brown, which is darker on every other segment.

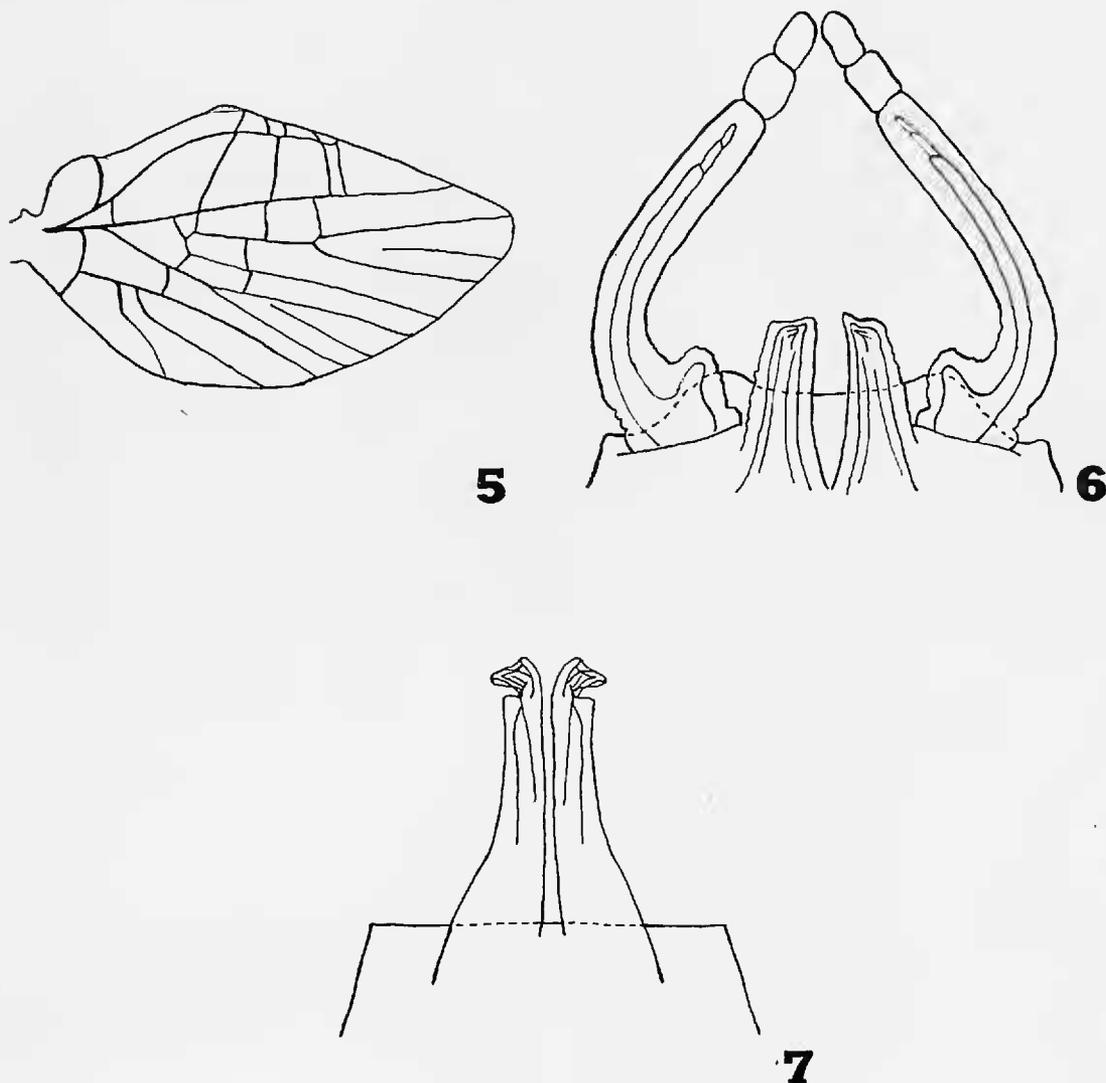
Female Subimago.—As in the male, with the following exceptions: length of body 11.0 mm.; forewing 11.4 mm.; caudal filaments missing. Coloration in general lighter than in male; maculation of abdominal tergites somewhat diffuse; sternites with posterior margin yellow, extending forward about

half the length of the segment medially and with antero-lateral yellow spots.

Holotype subimagal male, and allotype, subimagal female: NOVA TEUTONIA, SANTA CATARINA, BRAZIL, September 1956 (Fritz Plaumann, collector); preserved in alcohol. Both types are in the collection of the Illinois Natural History Survey. Paratypes: same data, except for dates; 2♂♂, September 1956, and 1♀, February 1957; all are subimagoes, preserved in alcohol, and in my personal collection.

Etymology: from L., patagiatus-bordered.

Ulmeritus patagiatus is closely related to *U. adustus* Thew, *U. flaveopodes* (Spieth), and *U. uruguayensis* Traver. The brown bordering of the veins of the wings, the maculation of the legs and abdomen, and the forms of the penis lobes make it easily separable from them, however.



EXPLANATION OF FIGURES

Fig. 5. *Ulmeritus adustus* Thew, hind wing; fig. 6. *Ulmeritus patagiatus* Thew, male genitalia of subimago; fig. 7. *Atalophlebia sepia* Thew, penis lobes.

GENUS DELEATIDIUM Eaton

Deleatidium vittatum Thew, new species

Female Imago.—Lengths: body 8.1 mm.; forewing 10.3 mm.; caudal filaments 11.0 mm. *Head*: yellow-white; vertex between compound eyes with broad transverse black-brown band; black stripes between lateral and median ocelli and beneath antennae; vestigial mouthparts broadly marked with black-brown. Antennal scape yellow-white, pedicel yellow-brown, flagellum missing. Compound eyes black. *Thorax*: pronotum yellow-white, with fine median longitudinal black line and two broad black oblique stripes; lateral margins and extreme median posterior margin broadly black; pleura yellow-white, shading into deep brown ventrally; sternum brown, except for extreme median area, which is yellow. Mesonotum light yellow with sutures faintly black; tip of scutellum white; pleura yellow-white, broadly marked with medium brown; sternum light yellow-brown laterally, darker medially. Metanotum yellow with broad dusky transverse bands in lateral areas and with lateral margins finely black; sternum and pleura same as for mesothorax. *Wings*: forewing hyaline, with costal and subcostal spaces infuscated with light red-brown. Veins C, Sc, and R light brown, other yellowish hyaline. Crossveins brown in the anterior region, fading to yellowish hyaline posteriorly. Hindwings hyaline, with veins slightly yellowish and with basal one-third of radius brown. *Legs*: all legs similar; femora light yellow, with faint brownish shading, which is concentrated into median and apical bands; tibiae and tarsi yellowish white, the latter lightly shaded with brown distally. *Abdomen*: yellow-white; tergites with posterior edges and lateral areas broadly infuscated with light brown; segments 1-4 with this shading continued medially on the anterior margin. All segments with black stigmatic dots. Sternites light yellow, with posterior margins broadly brown and anterior margins lightly infuscated with light brown. *Caudal filaments*: yellow-white, with joints brown.

Holotype female: NOVA TEUTONIA, SANTA CATARINA, BRAZIL, November 1956 (Fritz Plaumann, collector); preserved in alcohol; in the collections of the Illinois Natural History Survey. Paratype: 1♀, same data as for holotype; preserved in alcohol and in my personal collection.

Etymology: from L., vittatus-decorated or bound with a ribbon.

The genus *Deleatidium* Eaton is known from Australia, New Zealand, and South America; from this latter region seven species have been described, all of which are from the Andean mountain country. None possess the exact abdominal color pattern nor the thin brown ribbon on the anterior edges of the forewing, which are characteristic of *D. vittatum* Thew.

GENUS ATALOPHLEBIA Eaton

Atalophlebia sepia Thew, new species

Male Imago.—Lengths: body 10.0 mm.; forewing 12.0 mm.; caudal fila-

ments 19.0 mm. *Head*: blackish brown; face and vestigial mouthparts deep yellow, sparsely marked with black-brown. Antennal scape and pedicel deep brown, marked with black; flagellum yellow-brown. Compound eyes dark red-brown dorsally, changing to blackish ventrally. Ocelli deep yellow, ringed with black at base. *Thorax*: pronotum yellow-white, mottled with brown; median line very finely black; median posterior margin black; mid-way between median line and lateral edge there is a thick longitudinal black stripe; at the base of this commences a thick oblique black stripe; lateral margins bordered with black; dorsal half of pleura black, ventral half yellowish white; sternum yellow-brown. Mesonotum medium yellow-brown, with sutures finely black and with tip of scutellum black; pleura yellow, marked with brown, and with longitudinal stripe of white next to the anterolateral margin of the notum; sternum yellow-brown. Anterior half of metanotum yellow-brown, posterior half yellow-white; median area suffused with black and posterior edge finely margined with black; pleura and sternum as for mesothorax. *Wings*: hyaline; veins yellow-hyaline; extreme basal areas of C, Sc, and R interspaces of forewing infuscated with yellow-brown. Hindwing hyaline, except for extreme base anteriorly, which is shaded with brown; veins yellowish hyaline. *Legs*: all legs similar; coxae yellow, marked with blackish brown; trochanters yellow-white; femora yellow-brown, with median black-brown band and with apex dark brown; tibiae yellow-brown with apex dark brown; tarsi light yellow. *Abdomen*: tergites translucent white with the following black-brown markings on segments 1-7: 1) a median light stripe, finely bordered on each side with black (weak on segments 4-5); 2) immediately lateral to this, a thick longitudinal stripe, which angles away from the median line slightly at the anterior edge of the segment; 3) a wide band on posterior margin; 4) a large lateral spot, connected to the oblique stripe and the posterior band by thin dark suffused areas; 5) stigmatic dots. These markings reduced on segments 4-5, heavy on segments 6-7. Segment 8 yellow with thick black longitudinal stripes anteriorly on each side of median line, with a black oblique stripe on the lateral margin, and with a black stigmatic dot. Segment 9 similar but with stripes running the entire length of the segment and with the markings heavier. Segment 10 yellow, with median line and lateral edges black. Sternites yellow-brown with anterior margin hyaline and with anterior median area dark brown; segment 8 with pair of dark brown dots. *Genitalia*: yellow-brown, as in fig. 7. *Caudal filaments*: white, with every other joint widely banded with brown and the remainder only finely margined with brown.

Holotype male: FRUTILLAR, CHILE (province not known), February 15, 1950 (J. Herreci, collector); pinned in the collections of the Illinois Natural History Survey. Paratypes: 7 ♂♂, same data as for holotype; all pinned; six in the collections of the Illinois Natural History Survey, one in my personal collection.

Etymology: from *L. sepia*-cuttlefish, squid; ink; perverted to mean the rich brown color of such ink.

Outside of the seven unrecognizable species described by *L.*

Navas, there are four others from the neotropical region placed in this genus; they have been thoroughly reviewed by Demoulin (1955a and 1955b). The abdominal markings of *Atalophlebia sepia* Thew are very similar to those of *A. chilensis* Eaton, only the sternites presenting basic differences. Other specific characteristics are as follows: the penis lobes of each species are distinctive; in *sepia* the crossveins of the C and Sc interspaces are thickened as in *chilensis*, but, unlike this species, the remaining crossveins show no thickening or infuscation into the wing membrane; the crossveins of the C interspace in *sepia* number 18, with a space immediately distal to the triad R_{2+3} completely devoid of such veins, while *chilensis* has 22 crossveins in this space, evenly placed along the entire length; and last, the second joint of the fore tarsi of *sepia* is two-thirds of the third joint, while that of *chilensis* is six-sevenths of the third.

LITERATURE CITED

DEMOULIN, GEORGES

- 1955a. Ephemeropteres nouveaux ou rares du Chili. I. Bull. Inst. roy. Sci. nat. Belg. 31: no.22:1-15, figs. 1-5.
 1955b. Ephemeropteres nouveaux ou rares du Chili. III. Bull. Inst. roy. Sci. nat. Belg. 31: no.73:1-30, figs. 1-14.
 1955c. Une mission biologique Belge au Bresil. Ephemeropteres. Bull. Inst. roy. Sci. nat. Belg. 31: no.20:1-32, figs. 1-20.

EDMUNDS, GEORGE F., JR.

1948. A new genus of mayflies from western North America (Leptophlebiinae). Proc. Biol. Soc. Wash. 61:141-148, pls. V-VI.
 1950. Notes on Neotropical Ephemeroptera. I. New and little known Leptophlebiidae. Rev. de Entom. 21:551-554, figs. 1-4.

HARKER, JANET E.

1954. The Ephemeroptera of eastern Australia. Trans. R. ent. Soc. Lond. 105:241-268, figs. 1-90.

TRAVER, JAY R.

1947. Notes on Neotropical mayflies. Part II. Family Baetidae, Subfamily Leptophlebiinae. Rev. de Entom. 18:149-160, figs. 1-22.
 1956. A new genus of Neotropical mayflies. (Ephemeroptera, Leptophlebiidae). Proc. Ent. Soc. Wash. 58:1-13, figs. 1-18.
 1959. Uruguayan mayflies. Family Leptophlebiidae: Part I. Rev. Soc. Uruguay Ent. 3:1-19, pls. I-III.

ULMER, GEORGE

1943. Alte und neue Eintagsfliegen (Ephemeropteren) aus Süd- und Mittelamerika. II. Stett. Ent. Zeit. 104:15-46, figs. 33-65.